16/Appeal Brief (3)

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

In re application of	:	**Box AF**
SCHWARZ, Eugen, et al.	:	Group Art Unit: 1615
Serial No.: 09/529,543	:	Examiner: S. Tran
Filed: 14 April 2000	:	

For: PRODUCTION OF A DIRECTLY COMPRESSIBLE TABLETTING AID

Bet 11-28-01

BRIEF ON APPEAL

Assistant Commissioner for Patents
Washington, D.C. 20231

Sir:

Further to the Notice of Appeal filed August 20, 2001, herewith are three copies of Appellants' Brief on Appeal. The attached check includes the statutory fee of $320.00 for the filing of this Brief.

This is an appeal from the decision of the Examiner finally rejecting claims 1-20. See the Final Office Action of April 20, 2001, and the Advisory Action of August 8, 2001.

(1) REAL PARTY IN INTEREST

MERCK GESELLSCHAFT MIT BESCHRANKTER HAFTUNG, by virtue of an Assignment recorded May 17, 2000 (Reel 010830/Frame 0389), is the real party in interest herein.

(2) RELATED APPEALS AND INTERFERENCES

Appellants, their legal representative and the assignee are not aware of any related appeals or interferences which will directly affect or be directly affected by or have a bearing on the Board's decision in the instant appeal.

(3) STATUS OF THE CLAIMS

Claims rejected:	1-20.
Claims allowed:	None.
Claims objected:	None.
Claims canceled:	None.
Claims withdrawn:	None.
Claims on Appeal:	1-20.

(4) STATUS OF AMENDMENTS AFTER FINAL

Although a Reply After Final was mailed July 20, 2001, no claims were amended after the Final Office Action of April 20, 2001. In addition, Appellants' representative James E. Ruland conducted an interview with Examiner Tran and her supervisor Examiner Kishore on November 7, 2001.

(5) SUMMARY OF THE INVENTION

The invention relates to a directly compressible tabletting aid, which includes a xylitol content of more than 90% by weight and a content of at least one other polyol of less than 10% by weight (page 1, lines 3-6, and page 4, lines 31-35). The directly compressible tabletting aid is produced by dissolving the xylitol in a solvent and spray drying or fluidized bed granulation (page 1, lines 6-7, and page 4, lines 35-36).

In the past, known polyols mannitol, lactitol, isomalt and xylitol show poor tabletting characteristics, resulting in low tablet hardness, capping and high friability of the tablets. Page 2, lines 1-4.

In marked contrast, the invention relates to a directly compressible tabletting aid which is simple to produce, and has the following properties:

- improved tabletting properties by comparison with xylitol, in particular in relation to the resulting tablet hardnesses, the friability and the tendency to capping;
- improved taste-masking properties by comparison with known polyols; and
- advantageous effects on the sensory mouthfeel of the products.

Page 4, line 37 - page 5, line 11.

(6) ISSUES

1. Whether or not claims 1-5, 9, 12, and 13, on appeal, are allegedly anticipated by U.S. Pat. No. 5,536,526 (Virtanen) when Virtanen fails to teach or suggest a directly compressible tabletting aid produced by dissolving the xylitol in a solvent and spray drying or fluidized bed granulation?

2. Whether or not claims 1-5, 12-16, and 18, on appeal, are allegedly anticipated by U.S. Pat. No. 5,204,115 (Olinger) when Olinger fails to teach or suggest a directly compressible tabletting aid produced by dissolving the xylitol in a solvent and spray drying or fluidized bed granulation?

3. Whether or not claims 1-20, on appeal, are allegedly rendered obvious by Virtanen in view of U.S. Pat. No. 5,958,471 (Schwarz) and U.S. Pat. No. 5,576,014 (Mizumoto) when:

A. there is no desirability to support their combination?

B. the present invention exhibits significant and unexpected results?

(7) GROUPING OF THE CLAIMS

The claims do not stand or fall together. The claim groups are:

I. Claims 1-9 and 12-20;

II. Claims 10 and 11.

(8) APPELLANTS' ARGUMENTS

At the outset, the Examiner in the Advisory Action alleges that the rejected claims are product claims, and as such, the product-by-process claims are not limited to the manipulations of the recited steps, and the patentability is based on the product itself.

I. Claims of Group I.

First, Appellants respectfully submit that there is no anticipation because both the Virtanen and Olinger patents relate to granulating xylitol, not dissolving the xylitol in a solvent.

Second, even if the prior art and rationale provided by the Examiner appears to show that the claimed product is allegedly the same or similar to that of the prior art, although produced by a different process, then only the burden shifts to applicant to come forward with evidence establishing an unobvious (or novel) difference between the claimed product and the prior art product. *In re Marosi*, 710 F.2d 798, 802, 218 USPQ 289, 292 (Fed. Cir. 1983) and M.P.E.P. 2113.

In the present case, the Appellant can meet this burden because the claimed product made by dissolving the xylitol in a solvent is a homogeneous compressible tabletting aid while the granulates of Virtanen and Olinger are inhomogeneous. Particularly, Virtanen discloses:

> The granulation process is fundamentally different from the dry mixing of two polyols such as xylitol and sorbitol, such as that disclosed by G. B. Patent Nos. 1,526,020. The granulation process results in the crystallization of some of the sorbitol or present onto the surface of the xylitol particles forming fine, needle like protrusions. These needle like protrusions can be seen by electron microscopes, and a photograph showing the granulate of the present invention (with xylitol present in an amount of about 97% by weight, and sorbitol present in an amount of about 3% by weight) is shown in FIG. 1; the needle like crystals can be clearly seen. It is thought that the needle like protrusions are, or at least contribute to, the compressibility of the granulate of the present invention. Blends of xylitol and sorbitol in the proportion covered by the present invention which are simply admixed do not exhibit adequate compressibility and do not exhibit the needle like protrusions in electron micrographs such as those seen in FIG. 1.

Column 7, line 61, - column 8, line 11.

Thus, granulating forms sorbitol needle like protrusions on xylitol particles (an inhomogeneous composition) versus dissolving the xylitol in a solvent, which creates a homogenous composition. Thus, Appellants respectfully submit that there is sufficient evidence in the record to demonstrate the patentability (both novelty and unobviousness) of Appellants invention.

II. Claims of Group II

In addition, claims 10 and 11 are process and method claims, which are not subject to the rules governing product-by-process claims. Thus, the features of these claims should clearly be afforded full patentable weight.

Furthermore, as discussed in further detail below, producing an aqueous solution of xylitol and at least one other polyol, with the resulting mixture having a xylitol content of more than 90% by weight based on the total polyol content is not taught or suggested by the cited references. Thus, claim 10 is clearly patentable over the cited art.

1. Allegedly anticipated by Virtanen

Virtanen discloses a compressible granulate comprising about 94% to about 98% by weight of xylitol, about 1% to about 5% by weight of a polyol other than xylitol, and less than about 1% by weight of water (column 5, lines 38-42). The granulate is made, preferably, by granulating the ground xylitol with a small amount of sorbitol syrup to crystallize some of the sorbitol onto the xylitol particle surface (column 7, lines 21-25 and lines 61-63).

However, to anticipate a claim, the reference must teach every element of the claim. *See Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631, 2 U.S.P.Q.2d 1051, 1053 (Fed. Cir. 1987) and M.P.E.P. §2131.

Virtanen fails to teach a tabletting aid produced by dissolving the xylitol in a solvent. Rather, Virtanen granulates xylitol crystals. As discussed in Virtanen, the granulation process involves agglomerating crystalline xylitol (ground or otherwise comminuted to a small particle size) by means of polyol based syrup (column 6, lines 25-29). Thus, a granulation process involves the mixing of two or more ingredients in a solid state and leads to inhomogeneous

granules. In marked contrast, the tabletting aid of the present invention is produced by dissolving the xylitol in a solvent forming a homogeneous solution. Evaporating the solvent by spray drying or fluidized bed granulation leads to a homogenous tabletting aid.

In the Final Action and during the November 7, 2001 interview, reference is made to Example 2 of Virtanen wherein xylitol powder is allegedly mixed with a sorbitol syrup solution to make a solution. But at column 8, lines 42-44 of Example 2 states:

> A xylitol powder produced according to Example 1 and a 40% by weight sorbitol syrup solution (containing 34% by weight of sorbitol, and less than 5.7% of other polyols) **were introduced** into a granulator (Schugi, manufacturer Schugi, BV, Lelystad, Holland) at a speed of 800 kg/hour (powder) and 50 l/hour (syrup solution) at a temperature of 60 °C.

Column 8, lines 41-46, emphasis added.

Example 2 does not disclose mixing xylitol powder and a sorbitol syrup solution, but rather introducing both into a granulator. Virtanen does not disclose introducing both xylitol powder and sorbitol syrup as a single stream. In fact, this introduction can occur by introducing the xylitol powder and the sorbitol syrup separately into the granulator. Thus, the Example 2 (and the rest of the Virtanen reference) does not disclose forming a solution of xylitol powder and a sorbitol syrup solution. Moreover, there is no indication that the solution obtained is spray dried or "fluidized bed" granulated. Instead the sorbitol solution is said to be sent into a granulator. The resultant grains are then dried in a fluidized bed dryer. This technique is distinct from that claimed by Appellants and does not show or suggest the advantage of spray drying a solution of xylitol and another polyol or the advantage of treating such a solution to fluidized bed granulation.

Thus, there is no anticipation of the claimed invention.

2. Allegedly anticipated by Olinger

Olinger discloses a directly compressible, non-cariogenic xylitol granulate which comprises xylitol and a binder in the range of about 0.1% to about 5% by weight, wherein the binder is physiologically acceptable, non-cariogenic and is taken from the group consisting of polymerized reducing sugars, alkali carboxymethylcellulose and hydrogenated starch hydrolysate

(column 5, line 65 to column 6, line 4). In one method, an aqueous binder solution is added to milled xylitol, and the resulting granulate is dried and screened. (Column 7, lines 8-10). Thus, Olinger adds a solution to the granulate, but does not dissolve the granulate. Olinger also discloses a directly compressible granulate comprising a polyol such as mannitol, lactitol, sorbitol, isomalt and maltitol or a sweetener suitable for diabetic applications such as crystalline fructose and/or mixtures thereof, and a polydextrose binder present in the range of about 0.1% to about 5% by weight. (Column 7, lines 16-22).

However, to anticipate a claim, the reference must teach every element of the claim. See *Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631, 2 U.S.P.Q.2d 1051, 1053 (Fed. Cir. 1987) and M.P.E.P. §2131.

As discussed above for Virtanen, granulating is not the same as dissolving the xylitol in a solvent and spray drying or fluidized bed granulation. Olinger fails to teach a tabletting aid produced by dissolving the xylitol in a solvent. Thus, there is no anticipation of the claimed invention.

3. Allegedly rendered obvious by Virtanen in view of Schwarz and Mizumoto

A. *No desirability to support alleged combination*

Virtanen, as discussed above, granulates xylitol crystals. Schwarz relates, at least in part, to compositions obtainable by dissolving at least two polyols in water (column 2, lines 7-8). Virtanen fails to teach the desirability of dissolving the xylitol crystals in a solvent for, after subsequent processing, creating a tabletting aid. The mere fact that references can be combined or modified does not render the resultant combination *prima facie* obvious unless the prior art also suggests the desirability of the combination. See *In re Mills*, 916 F.2d 680, 16 USPQ2d 1430 (Fed. Cir. 1990), MPEP 2143.01. Here, Virtanen's requirement that crystals of xylitol contain a surface coating of crystals of another polyol teaches against forming a homogenous solution of xylitol and polyol prior to crystallizing. Thus, there is no motivation to combine these references. Further demonstrating the lack of motivation to combine these references, Schwartz broadly defines the suitable range of "between 50:50 and 99:1" for compositions of sorbitol and xylitol at col. 2, lines 13-15. This ratio is inconsistent with the proportions required

by Virtanen, namely 94% -98% xylitol (column 5, lines 38-43). There is no teaching or suggestion to modify the composition proportions of Schwartz to make them compatible with Virtanen. Lacking this teaching, there is no motivation to support this combination of references.

Moreover, Mizumoto fails to cure the deficiencies in the Virtanen reference because Mizumoto's dissolving compressed molding is also made by mixing or granulating various components, *see e.g* column 7, lines 19-46. Consequently, there is no *prima facie* case of obviousness.

B. Significant and Unexpected Results

Supererogatorily, the present invention exhibits significant and unexpected results. A *prima facie* case of obviousness based on similarity is rebuttable by proof that the claimed invention possesses unexpectedly advantageous or superior properties. See *In re Papesch*, 315 F.2d 381, 137 USPQ 43 (CCPA 1963) and MPEP 2144.09.

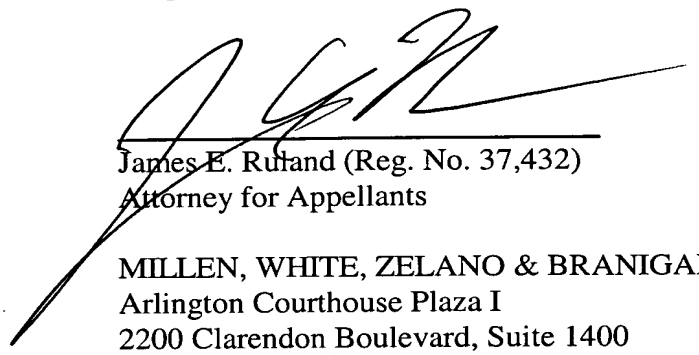
The Action of September 12, 2000, alleges that there is no criticality in the amount of a particular component, *e.g.* xylitol, because the prior art obtains the same results desired by Appellant, *i.e.* a direct compressed tablet. This Action also alleges that the amount has not been shown to provide any unusual and/or unexpected results over the applied prior art.

Appellant traverses these allegations. As discussed in the present specification, comparative example 2, pure xylitol, even spray dried, does not possess the required tabletting properties. Rather, the addition of up to 10%, preferably 5-10%, of a second polyol, preferably mannitol, can achieve the desired results (see, e.g. Examples 1-4). Consequently, Appellants respectfully submit that the present invention exhibits significant and unexpected results.

(9) CONCLUSION

For all of the above reasons, it is urged that the decision of the Examiner rejecting claims 1-20, on appeal, is in error and should be reversed.

Respectfully submitted,



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APPENDIX OF PENDING CLAIMS

1. **(Amended)** A directly compressible tabletting aid, comprising a xylitol content of more than 90% by weight and a content of at least one other polyol of less than 10% by weight, produced by dissolving the xylitol in a solvent and spray drying or fluidized bed granulation.

2. **(Amended)** A directly compressible tabletting aid, according to Claim 1, wherein polyols present in addition to xylitol are selected from the group consisting of mannitol and lactitol.

3. **(Twice Amended)** A directly compressible tabletting aid, according to Claim 1, wherein it is obtainable by dissolving xylitol and at least one other polyol in water and spraying the resulting aqueous mixture in a stream of air at a temperature of from 120°C to 300°C.

4. **(Twice Amended)** A directly compressible tabletting aid, according to Claim 1, wherein it is obtainable by dissolving xylitol and at least one other polyol in water and fluidizing the resulting aqueous mixture in a stream of air at a temperature of from 30°C to 110°C.

5. **(Twice Amended)** A directly compressible tabletting aid according to Claim 1, wherein the xylitol and mannitol; xylitol and lactitol; or xylitol, mannitol and lactitol are employed as polyols.

6. **(Amended)** A directly compressible tabletting aid according to Claim 5, wherein the ratio of xylitol to mannitol is 90:10 to 98:2.

7. **(Amended)** A directly compressible tabletting aid according to Claim 5, wherein the ratio of xylitol to lactitol is 90:10 to 98:2.

8. (Amended) A directly compressible tabletting aid according to Claim 5, wherein the xylitol:mannitol:lactitol ratio is between 90:1:9 or 90:9:1 and 98:1:1.

9. (Twice Amended) A directly compressible tabletting aid according to Claim 1, wherein the water content is less than 1% by weight.

10. (Twice Amended) A process for producing a directly compressible tabletting aid according to Claim 1, comprising:

a) producing an aqueous solution of xylitol and at least one other polyol, the resulting mixture having a xylitol content of more than 90% by weight based on the total polyol content,

b1) spraying the resulting mixture in a stream of air at a temperature of from 120°C to 300°C, evaporation of the water taking place,

b2) fluidizing the resulting mixture in a stream of air at a temperature of from 30°C to 110°C, evaporation of the water taking place, and

c) isolating the tabletting aid.

11. (Twice Amended) A method for producing a shaped or unshaped polyol composition by melt extruding a directly compressible tabletting aid mixture according to Claim 1.

12. (Twice Amended) A composition or formulation comprising a directly compressible tabletting aid according to Claim 1.

13. (Twice Amended) A solid form or compact, comprising a directly compressible tabletting aid according to Claim 1.

14. (Amended) A solid form or compact according to Claim 13, comprising one or more water-insoluble and/or water-soluble additions homogeneously dispersed.

15. **(Twice Amended)** A solid form or compact according to Claim 13, comprising citric acid as addition.

16. **(Twice Amended)** A solid form or compact according to Claim 13, comprising at least one active pharmaceutical ingredient, sweetener, colorant, vitamin or trace element.

17. **(Amended)** A solid form or compact according to Claim 16, comprising at least one active pharmaceutical ingredient which is an analgesics or antacid.

18. **(Amended)** A solid form or compact according to Claim 16, comprising at least one sweetener which is acesulfame K, aspartame, saccharin, cyclamate, sucralose or neohesperidine DC.

19. A directly compressible tabletting aid according to Claim 5, wherein the ratio of xylitol to mannitol is in a range between 90:10 to 95:5.

20. A directly compressible tabletting aid according to Claim 5, wherein the ratio of xylitol to lactitol is in a range between 90:10 to 95:5.